Product Overview

Uninterruptible Power Supplies (UPS)
For more than a century, GE has led the way with innovative technologies and groundbreaking quality initiatives – literally helping to power the world. Along the way, through the development and delivery of state-of-the-art products and uncompromising service, GE has also built a legacy as a leading supplier of critical power solutions.

To bridge the gap between the traditional utility grid and the needs of today’s business, GE offers a complete portfolio of critical power products and services, from desktop Uninterruptible Power Supply (UPS) units to engineered power systems, and from basic UPS and battery maintenance to comprehensive service contracts covering every aspect of your power quality and delivery system.

At GE, our goal is simple – to never let power quality stand in the way of our customers’ success. That’s why GE is committed to continue developing and delivering UPS technology for the digital world.
**UPS Topologies**

**Offline**

VFD (Voltage Frequency Dependent)

Offline UPS system channels the incoming mains power, via a filter, directly to the load. As soon as the incoming power is outside tolerance, the UPS switches to battery operation.

**Line-interactive**

VI (Voltage Independent)

Line-interactive UPS system channels the incoming mains power, via an AVR - Automatic Voltage Regulator, directly to the load. Compared to off-line, the system can handle much larger voltage variations before switching to battery operation.

**Double conversion**

VFI (Voltage Frequency Independent)

Input and output are completely separated: the output converter (DC to AC, or ~ to ~) continuously supplies the critical load with a completely new, regulated and clean sine wave output. No switching takes place when the incoming mains power gets outside tolerances. A bypass switch automatically transfers the load to the mains when the output converter is unable to supply the load.

**MAINS DISTURBANCES**

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<thead>
<tr>
<th></th>
<th>1-phase</th>
<th>3-phase</th>
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<tbody>
<tr>
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<td>✓</td>
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<tr>
<td>Frequency variations</td>
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VCL Series
1-phase
400-1500 VA

Features & benefits
• High operating efficiency. The VCL Series operates as standard at a high efficiency (>95%), minimizing losses and reducing cooling costs.
• GE’s VCL Series offers both power protection and surge protection outlets. Power protection outlets ensure that critical loads are closed down in a safe, controlled manner in the event of an extended mains failure; surge protection outlets provide power conditioning to less critical loads (e.g. printers). Additional surge protection for data lines is provided.
• Automatic shutdown software is provided free of charge with every UPS.
• Automatic voltage regulation (AVR) corrects voltage drops and surges coming through from the mains without the UPS resorting to battery. The life of the battery is maximized and the user is still ensured ongoing consistent power to the load.

Applications
• PCs
• Servers
• Small networks
• CCTV
• Electronic Point of Sale (EPOS)
• Petrol pumps
• Networking peripherals
• ATMs
• Parking meters

400/600/800/1000/1500 VA
Uninterruptible Power Supply (UPS)

GE’s VCL Series UPS offers continuity in a compact, lightweight and cost-effective solution. The VCL Series range of Uninterruptible Power Supply (UPS) connects between the mains supply and your critical load to ensure, when the mains power supply drops or fails, your load continues to receive a clean, constant and reliable source of power until a graceful and safe shutdown of the load can be performed. Hardware and data is protected and operations are reliably maintained.
GE’s VCO Series is a true double conversion Voltage and Frequency Independent (VFI) Uninterruptible Power Supply (UPS), providing the highest level of protection to all loads. Regardless of the quality of power from the grid, the VCO Series will create a brand new sine wave with a fully regulated voltage and frequency; the supported load receives a constant, moderated supply. When the grid power fails, the battery seamlessly steps in to continue the supply and allow for enough time to finish the current process before gracefully initiating an automatic shutdown of the load until the mains returns.

Features & benefits

- High output power factor provides more actual power to the load and avoids the need to oversize the UPS.
- Rack and/or tower format in a single cabinet. There is no need to select form factor when ordering, and allows for maximum site flexibility. As network demands change, the VCO Series can adapt with the changes.
- Automatic battery test makes a periodic health check of the batteries, ensuring no surprises. When the battery is required, the battery is available.
- RS232 and USB communication as standard for maximum flexibility on load connectivity.
- SNMP card supporting all major operating platforms. The UPS can be monitored and managed across a network, with web enabled SNMP configuration for full visibility of UPS operation from any location.
- >95% efficiency in high efficiency mode, reducing energy and operation costs on site.
- Multiple outlets for all ratings; several pieces of equipment can be connected to the VCO Series without adding PDUs or extension strips. One set of outlets can be programmed to switch off in order to increase the remaining runtime.
- Lightning and transient surge protection for additional protection against voltage spikes.

Applications

- PCs
- Servers
- Mid-sized networks
- Voice/data networks
- Telecom
- Light industrial

1000/2000/3000 VA
Uninterruptible Power Supply (UPS)

1000-3000 VA

1-phase

VCO Series

1000-3000 VA
GE’s VH Series of UPS is a true VFI (Voltage & Frequency Independent) on-line double conversion, intelligent and high-performance UPS designed for all mission-critical applications. The UPS range is designed with a unique failsafe bypass providing maximum security and reliability for the user.

The VH Series range of UPS has been designed also for maximum site flexibility. With an attractively designed modern common tower and/or 19 inch rackmountable design, the UPS can adapt as network configurations adapt.

For communication, the VH Series is provided with USB and contact interface as standard; an easy to install option card is available with RS232, USB and relay. A web-enabled SNMP card is available as an option.

### Features & benefits
- Voltage and frequency independent (VFI) double conversion technology eliminates power reliability problems.
- Unique failsafe internal bypass for continued operation even in the event of UPS failure.
- Tower and/or 2U rack design for all ratings; all support elements included.
- Simple battery replacement without disruption to supported load.
- Versatile communication with USB and contact interface, RS232, relays and SNMP.
- Wide input voltage window minimising battery usage.
- Excellent short circuit protection.
- GE’s unique Superior Battery Management enhancing battery performance and lifetime.
- Easy plug-in connection of battery packs for extended run-time.
- Remote monitoring and control for unmanned or isolated sites.
- Can be used as a 50/60Hz frequency converter.
- Phase neutral reversal protection.
- High overload capability.
- Precise output frequency regulation.
- High efficiency.

### Applications
- Mission-critical servers
- Telecommunication equipment
- Local area networks
- Laboratory devices
- Internet servers
- Network components
- Process and telecom industry equipment
GT Series
1-phase
6-10 kVA

With GE's GT Series, your mission-critical equipment is protected from any fluctuation in your power source, enabling you to concentrate on your core activities. The GT Series is a true VFI (Voltage & Frequency Independent) on-line double conversion, transformerless, intelligent and high performance installable UPS.

This UPS provides critical power protection to suit a wide range of IT Networks, Telecom and other applications. The GT Series is easy to install and service, and is designed for maximum site flexibility. With an attractively designed modern common tower and/or 19inch rack mount cabinet, the UPS can adapt as network configurations adapt.

Both the power and redundancy of the system can be expanded by adding units (N+2) to create a parallel system. For communication, the GT Series is equipped with RS232 and contact interface as standard; a web-enabled SNMP card is available as an option. Operation in remote or unmanned sites is simple to coordinate with the standard remote monitoring functionality. No load shutdown, automatic frequency detection, settable minimum start-up runtime and extended runtime availability with optional battery packs are additional features of the GT Series UPS.

Features & benefits

• On-line double conversion technology assuring ultimate power quality.
• (Remote controlled) programmable computer shutdown.
• Combined tower/rack for maximum flexibility.
• Wide input voltage window to minimize battery operation.
• Small footprint & low weight, ideal for IT applications or sites with limited available space.
• Hot swappable batteries for easy battery replacement without dropping the load.
• Simple installation of paralleling cable for expanded power and redundancy of the system.
• Backfeed protection as standard providing optimal safety for installation.
• Frequency converter (50Hz – 60Hz) also in parallel operation.
• All components for Rack, Tower & Parallel installation are included with the UPS.

Applications

• Computer and data centers
• Call centers
• Telecommunications equipment
• Security systems
• Financial institutions
• Fixed and mobile voice and data transmission
LP 11/31T/31 Series
1-phase
3-20 kVA

GE’s LP Series provides critical power protection for many applications. The LP Series is easy to install and service, optimised for the office environment. The robust design is also suitable for more traditional, industrial applications.

Both the power and reliability of the system can easily be expanded by adding units, creating a redundant system which has no single points of failure (LP 11/31T Series). This is achieved by utilising GE’s unique Redundant Parallel Architecture™ (RPA™) technology.

Designed as a true VFI (Voltage and Frequency Independent) UPS, the LP Series is an on-line double conversion, intelligent and heavy duty UPS. The VFI concept ensures the highest level of protection, even under the toughest conditions.

Features & benefits
- Low input current distortion and high input power factor eliminates need for costly filters or oversized generator.
- Small footprint and wheels.
- Advanced technology enabling silent operation.
- High output power factor allows for optimal sizing of UPS.
- Low output voltage distortion.
- Superior Battery Management.
- ECO mode enables automatic energy savings under stable power conditions.

Applications
- Computer and data centers
- Call centers
- Manufacturing and process control units
- Medical equipment and healthcare facilities
- Transportation infrastructure
- Security systems
- Financial institutions
- Fixed and mobile voice and data transmission
GE’s LP 33 Series is a highly reliable transformerless three phase UPS system providing power protection for a wide range of critical applications from medical to datacenters and telecommunication.

GE’s clean input Active IGBT rectifier technology provides a high input UPS power factor (0.98) and low input harmonics distortion on the input current. This allows the user to save in the sizing of upfront UPS equipment: generator sets, cabling and circuit breakers, avoiding also any additional reactive power from the utility distribution. The LP 33 Series UPS offers reliability at its best. To further increase system reliability, 2 or more units can be connected in parallel. In this way a redundant fault-tolerant system is created with maximum power availability and reliability. The decentralized bypass offers maximum flexibility to the end-user for future expansion of the system.

Features & benefits

- Voltage Frequency Independent (VFI) operation fully compliant with international standards (IEC 62040-3) providing full power protection for demanding critical applications.
- Low input power factor and harmonic distortion, allows the user to save in the sizing of upfront UPS equipment: generator sets, cabling and circuit breakers.
- Front access for all service and maintenance reducing operational footprint.
- Excellent dynamic response preventing the need for oversizing in case of pulsating loads.
- EMC class A filters are installed as standard (at no additional cost) in the UPS, ensuring the reduction of interference with other equipment supported in the application (telecom, broadcasting,…).
- The low footprint of the LP33 Series is best in class and provides the user with more space for other equipment.
GE’s SitePro family of high-performance UPS systems provides critical power protection for a range of applications. All SitePro models operate in a double conversion mode (providing true on-line operation), thus providing the highest levels of power reliability. Each UPS is fully compliant with international standards regarding Voltage Frequency Independent (VFI) operation.

This continuous on-line UPS is available in models from 10-40 kVA. For high-power redundant applications, the GE SitePro can be installed with up to six units in parallel, achieving power protection up to 240 kVA. The systems are controlled in a true peer-to-peer configuration with redundancy in all critical elements and functions utilizing GE’s exclusive Redundant Parallel Architecture (RPA) technology.

### Features & benefits
- High output power factor eliminates need for UPS oversizing.
- Constant high efficiency at full and partial load.
- Superior Battery Management (SBM) to enhance battery life and to prevent battery failure.
- Super ECO Mode for energy savings.
- Extremely low output distortion even at non-linear loads.
- Highest levels of reliability and flexibility with Redundant Parallel Architecture™ (RPA™).
- Best in class for variable load applications.
- Various operation modes: double conversion; voltage and frequency stabilizer; frequency converter.
- Galvanic isolation which provides additional critical power protection.
- UPS monitoring and protection software.
- Backfeed protection standard included providing a safe work environment.

### Applications
- Computer and data centers
- Call centers
- Manufacturing and process control units
- Medical equipment and healthcare facilities
- Transportation infrastructure
- Security systems
- Financial institutions
- Fixed and mobile voice and data transmission
Delivering Best-in-Class Efficiency with Innovative Technology

GE’s TLE Series UPS is one of the most efficient and reliable three-phase UPS systems, providing best-in-class efficiency, output performance and critical power protection for your data center needs. The TLE Series UPS solutions are optimized to provide high efficiency at part load conditions. The TLE Series UPS helps assure low input current harmonic distortion, best-in-class output voltage regulation and dynamic response. This helps customers save operational costs while implementing environmentally friendly solutions.

The TLE Series UPS provides industry-leading reliability, efficiency, clean input performance and unity power factor at output. Reliability can be further increased by paralleling more units utilizing GE’s unique RPA™ (Redundant Parallel Architecture) technology. Through their complete life cycle, all GE UPS systems are fully supported by service teams which provide world-class, 24x7 preventive and corrective services, training and application expertise.

Features & benefits

• High efficiency in double conversion mode up to 96.5% and eBoost mode operation up to 99%.
• Clean input performance keeps the supply network clean and provides advantages by reducing size of circuit breaker, cables and generator.
• True front access for operation and maintenance reduces mean time to repair (MTTR).
• Smaller size reduced installation and operational footprint.
• Redundant Parallel Architecture (RPA) for reliability, redundancy and scalability up to 6 UPS.
• Enhanced output performance with unit power factor to protect and supply modern IT load.
• Excellent dynamic performance and low output voltage distortion.
• Improved diagnostic capabilities with waveform capture and capacitor monitoring.

Applications

• Large data centres
• Server farms
• Telecommunication installations
• Internet service providers
• Transportation systems
• Security operations
• Process control equipment
• Financial systems
• Industrial systems
• Healthcare
SG Series
3-phase
10-600 kVA

Features & benefits
• Voltage Frequency Independent (VFI) operation fully compliant with international standards (IEC 62040-3) providing full power protection for demanding critical applications.
• Front access for all service and maintenance reducing operational footprint.
• Output power factor real 0.9 leading (capacitive loads) provides full power capability and prevents the need to oversize in case of power factor corrected loads (SG 10-40 kVA - 1.0 PF).
• Excellent dynamic response preventing the need for oversizing in case of pulsating loads.
• Superior Battery Management (SBM) enhances battery lifetime resulting in reduced cost of operation.
• Maintenance bypass integrated in UPS cabinet, no need for external switches.
• Fully compliant with EMI international standards (IEC 62040-2) and safety standard (IEC 62040-1).
• Preventative maintenance and advanced diagnostic information using the PMAD feature.
• High efficiency in eBoost mode (160-500 kVA) and super Eco Mode (10-120 kVA).

Applications
• Computer and data centers
• Call centers
• Manufacturing and process control units
• Medical equipment and healthcare facilities
• Transportation infrastructure
• Security systems
• Financial institutions
• Fixed and mobile voice and data transmission

With Ultra-High Efficiency eBoost™ Technology
GE's SG Series is one of the best performing and most reliable three-phase UPS systems providing critical power protection for a wide range of applications. Every SG Series system operates in VFI mode (Voltage Frequency Independent). It was developed using GE’s Design for Six Sigma methodology to ensure that the product fully meets customer requirements and expectations.

PurePulse™ - IGBT Rectifier Clean Input Performance
GE's SG Series UPS in the range from 10-500 kVA are available either with traditional thyristor rectifier technology, or with a rectifier based on GE's cutting edge PurePulse technology. PurePulse is an innovative control algorithm applied on the IGBT rectifier. This current source rectifier assures an Input Total Harmonic Distortion (THDi) of less than 3%, and draws a pure sinusoidal waveform from the mains. PurePulse is a breakthrough innovation from GE.
GE’s Intelligent Energy Management integrated (IEMi) operating mode offers the capability to optimize and increase system efficiency while maintaining the system reliability for UPS’s in a redundant parallel architecture (RPA™).

UPS system sizing accounts for normal load requirement, overload and capacity for future expansion. In addition, redundancy level of N+1 or N+2 is considered to enhance system reliability.

Most UPS systems typically operate at low load levels (<50%). At load level of less than 30-40%, efficiency of UPS decreases in comparison to normal operating load range of 40%-75%. In redundant parallel architecture (RPA™) system of 4 UPS modules its more efficient to have 2 UPS operating at 40% load range than 4 units operating at 20% load range.

For parallel UPS installations, IEMi operating mode saves energy by dynamically utilizing the UPS modules as needed to meet the required output power without compromising power quality to the critical load.

Features & benefits
- User programmable scheduling
- Front graphic panel accessible set-points
- Reduction in UPS losses and cooling
- Double conversion operation - no compromise on power quality
- System energy cost savings
- Redundant operation - no compromise on system reliability
- Cyclic operation ensures even UPS run-time

Energy consumption is a critical issue for IT organizations as their energy demands continue to grow. Their goal is to reduce cost and keep the datacenter running. IT organizations can reduce energy consumption and costs - without sacrificing reliability - with GE’s eBoost™ technology.

e = high efficiency (up to 99%)
Boost = fast power transfer (< 2ms)

Features & benefits
- Up to 99% UPS efficiency
- System energy cost savings
- Fast transfer to inverter < 2ms
- User-programmable scheduling
- Compliant to ITI (CBEMA) curve during undervoltage events
GE provides a unique technology called Redundant Parallel Architecture™ (RPA™) that can parallel Uninterruptible Power Supply (UPS) modules with true redundancy.

With RPA™, there is no need for external electronics or switches to control the UPS modules in the parallel system. One of the UPS modules in the system arbitrarily takes a leadership role, while the other UPS modules have access to all control parameters. If one UPS fails to operate, the load is automatically redistributed among the others. If the lead UPS fails to operate then a different UPS automatically takes on the leadership role.

The RPA systems are designed to have no single points of failure, ensuring the highest level of power protection for critical loads.

Features & benefits
- No single point of failure - distributed control logic and redundant communication
- UPS system scalable and modular
- No additional equipment required
- Precise load sharing and phase synchronization
- On line maintenance

Standard RPA™ Configuration: True Redundancy with Distributed Control & Bypass
STS - Static Transfer Switch
230 V / 3x400 V, 25-1000 A  2/3-pole

Static Transfer Switches (STS) are designed to transfer the supply between two independent AC power sources. Unlike traditional automatic transfer switches (ATS), a static transfer switch provides a fast load transfer (typically 1/4 of a cycle), which ensures uninterrupted operation of sensitive electronic equipment. Load retransfer to the preferred input source is virtually instantaneous (typically <6 ms).

Features & benefits
• Selectable voltage limits for full flexibility to protect equipment against sags, swells and interruptions
• Negligible transfer time between two synchronized sources
• Surge protection to prevent damage to the STS and the supplied equipment

Applications
• Power industry
• Power supply systems for petrochemical industry
• Computer and Telecommunication centers
• Automatic and security systems of ‘intelligent’ buildings

ISM - Intelligent Synchronization Module

GE Critical Power’s ISM allows the synchronization of two independent groups of parallel UPSs in RPA™ configuration, allowing to supply critical loads by two separate sources via Static Transfer Switch with negligible switching time.

Group A and B are synchronized continuously so the static transfer switch can transfer the critical load from group A to group B or vice versa
Connectivity Solutions
SNMP web adapter features

- SNMP Adapter - makes all UPS information available on a computer network (Ethernet)
- Complies to the standard UPS-MIB (RFC1628)
- Built-in HTTP-server
- Common firmware and graphical interface for all Web Adapters
- Easy firmware update via network (ftp)

- Multiple rights for user accounts
- Direct e-mail service configurable via web browser
- Shutdown command up to 30 remote servers
- Download UPS Parameters & events (4000 / 9000)
- Provides data of each UPS connected to RPA
- New functionalities available with software updates NO HW changes required!

Modbus TCP

- UPS values as signed integer or Floating 32bit
- Easy configuration via Web Interface
- License activation based on card MAC address
- UPS alarms, measures and status monitoring for all UPS in RPA

UPSMAN & RCCMD
Data protection software

UPSMAN – description
- Data Protection Software
- Supports Rs232, USB & SNMP communication
- Free software license
- Written in native language
- Supports most popular OS, including virtualization

SNMP CARD & RCCMD server

RCCMD – description
- Light background protection software
- Native solution for more than 35 OS
- React on shutdown commands
- Each server needs a valid license

Servers acknowledge the RCCMD shutdown command sent by the SNMP Adapter and begin system shutdown.

SNMP adapter sends RCCMD shutdown command to remote servers to initiate the shutdown process.
iUPSGuard
Remote monitoring solution for UPS

Securing critical power
GE's iUPSGuard is a remote monitoring solution for UPS, providing status monitoring and alarm notification that supports all GE UPS product lines, anytime, anywhere. iUPSGuard provides current and detailed information about UPS operation, including its configuration, internal alarms and operating conditions over web. iUPSGuard notifies personnel of critical alarms and events via email or SMS, allowing a user or GE technician to make timely decisions on critical conditions. In addition, comprehensive data collection and analysis improves diagnostics capability and enhances response time. Continuous monitoring and ongoing maintenance help ensure maximum performance of your UPS equipment as it protects business critical applications.

Key benefits

Improved response time and high availability
- 24x7 monitoring of UPS status and operating parameters
- Provides instant alerts in case of critical alarms and events available over web that allows immediate fault analysis as well as corrective actions
- Availability of detailed UPS status improves pre-dispatch diagnostic and first time fix as the service team is arriving pre-informed
- iUPSGuard provides early warning of parameters, operating conditions and diagnostic information that allows resolution of operating anomalies.

Regular UPS status reports
- Detailed reporting system of iUPSGuard provides valuable information on equipment operating conditions and trends over period of time
- Summary of events that have occurred and their frequency and duration for the entire monitoring period
- Preparing maintenance recommendation based on data analysis.

Flexible and scalable
- iUPSGuard can communicate through various channels and monitors single UPS or parallel UPS systems through web/SNMP card.

Key features

Safe and secure
- Highly secure and efficient data transmission
- SSL encrypted unidirectional communication
- Firewall friendly - no changes required to firewall settings or proxy servers providing easy deployment and addressing compliance objectives

Flexible communication options
- Supports various communications including IP and GPRS
- Alarms notification through email and SMS

24x7 UPS status and monitoring
- Optimized data transmission helps ensure the latest and most up-to-date information is available
- Alarms and other critical events are submitted automatically on occurrence of event, all other values on a regular basis
- Data collection of status values, settings, as well as alarm and event logs
- Easy to configure and connect
Whether you are a large corporation with multiple sites or a small business owner with a single location, GE will enable you to have a constant supply of clean and reliable power to keep your business up and running.

Service coverage
GE has local offices in a number of countries around the globe and also a network of selected business partners, whose salespeople and service engineers combine expertise in our solutions with an in-depth knowledge of local market conditions.

GE’s service & authorized service providing business partners, located in more than 100 countries around the world, use all that expertise and knowledge to adapt GE’s products and services precisely to their customers’ needs.
GE offers a comprehensive portfolio of power quality services including:

**On site & emergency services**
- 24x7 emergency hotline
- Installation, commissioning, start-up
- Repair, upgrade, retrofits
- Assessment, battery services, inspection, testing

**Service agreements**
- Maintenance & service contracts
- Extended warranty
- Guaranteed response / intervention times
- Preventive and planned maintenance
- Resident technical services
- Custom CSA (Contractual Service Agreement)

**Spare parts and repairs**
- Spare parts and repair services for optimum operating safety and reliability
- Replacement / return
- Web based parts supply
- UPS rental

**Support and remote services**
- On-line technical assistance
- Remote monitoring & diagnostics
- Software upgrades
- Training & knowledge assessment
- Privileged access to online information

**Online support - your advantages**
- Written entries avoid misunderstandings
- Data transferred through secure and reliable connections
- Acknowledgement mail with case number and copy of your request
- Availability 24x7
- Multilingual options
- Worldwide dialog platform for all topics